College Board
SpringBoard Geometry, Geometry

Degree of Evidence regarding the Standards for Mathematical Practice:

Moderate Evidence

Summary of evidence:

1. **Make sense of problems and persevere in solving them**. In the chapters reviewed, there are numerous opportunities for students to analyze the mathematics and to explain their findings. Lots of open-ended questions are presented both as investigations and as practice problems (e.g. p.549 #13). Exposure to a variety of representations is present, including models, equations, tables, etc. There are opportunities for self and peer revision based on the teacher implementing the suggested learning strategies (e.g. p.416 #9, p.419 #22). Overall, there are frequent open-ended problem-solving opportunities for students as they discover the concepts for themselves. There are frequent opportunities for students to create a problem-solving plan and to carry it out, checking their results for accuracy.
2. **Reason abstractly and quantitatively**. In the chapters reviewed, application problems are presented throughout. Students are frequently asked to create a model for the problem situation. For example, within the unit on solids, students worked with nets, isometric drawings, and 3-d models. Students are frequently, if not always, led to derive the formulas through investigations and then to represent their findings using symbolic notation. Units are used throughout the text in all problems. Students work with both exact values and decimal approximations. There are numerous application problems or examples spread throughout each unit. Questions are geared towards students discovering the algorithm for the mathematics or the formula on their own or in groups, rather than just being presented with the formula from the start.
3. **Construct viable arguments and critique the reasoning of others**. The opportunities for students to explain their reasoning are present in the student problems (e.g. p.419 #21, 23, p.421 #26d). Opportunities to communicate justification and to critique the reasoning of others are found through the suggested learning strategies. It would be up to teacher implementation to facilitate the class discussions. Examples of discussion on justification are limited in the chapters reviewed. The teacher resource does have some suggestions on how to help with class discussions and common misconceptions. The opportunities for students to justify their thinking are available throughout the text, but they rely a great deal on how the teacher facilitates the lesson. Overall, this text provides suggested ways to incorporate the critiquing of the reasoning of others, but is not inherent in the student resource.
4. **Model with mathematics**. In the chapters reviewed, students are frequently asked to create mathematical models. Projects included throughout the text also encourage students to create models as well as to make connections between prior knowledge and new knowledge (e.g. p. 402, p.433, p.543). In the application questions, answers are in context. As students progress in their understanding of the concept covered in the lesson, they continue to build the connection among tables, equations, and situations. There are frequent opportunities for students to create and work with models while grappling with the concepts they are asked to discover on their own. Students move from the models to the symbolic representations or formulas they have conjectured and tested on their own.
5. **Use appropriate tools strategically.** In the chapters reviewed, geometric constructions are presented as a separate concept rather than as a tool to aid in understanding geometric concepts and properties. Students are asked to use rulers, protractors, 3-D models, nets, and so on throughout the text. Graphing calculators seem to be only mentioned when working with

trigonometry. There is mention of using geometric computer software to aid in student understanding, both in investigations and practice problems (e.g. p.262 investigation, p.354 #24, p.561 #21, 22). There is little mention about technology use, so the teacher would need to implement it accordingly. In the chapters reviewed, there did not seem to be an analysis of the strength and weaknesses of certain tools with respect to the problem scenario.

6. **Attend to precision.** Examples use proper notation and are precise. The teacher resource stresses the importance of accurate units (e.g. p.425 #3). Students are asked to round to varying decimal places. In the chapters reviewed, the importance of precise communication is mainly presented in the teacher resource under the "Sharing Ideas" section. There are some problems where students are asked to conduct error analysis to correct misconceptions presented in a particular solution or statement. Students are given opportunities to share their solutions and compare their findings within their cooperative learning groups, but this depends on teacher implementation. There is attention to precision in the examples, but no discussion for students to tackle unless the teacher incorporates the opportunity on his/her own.
7. **Look for and make use of structure**. In the chapters reviewed, there are frequent opportunities for students to look at examples and then generalize the mathematics. Students almost always discover the mathematical rule for themselves through the investigations. The rule, or formula, is then completed by the students. The formula is not already printed in the book for them. Most activities explore patterns to create generalizations. Students are continually asked to activate their prior knowledge to tackle new problems or conjectures. There are numerous opportunities for students to generalize their findings. The rule is usually left for the students to investigate and discover on their own.
8. **Look for and express regularity in repeated reasoning.** In the chapters reviewed, there are frequent examples where the resource asks students to look at patterns and to compare their findings with others in order to arrive at a generalization. Questions lead them to develop formulas for themselves. For example, students derive all the surface area formulas on their own through the work they complete in the chapter on volume. Students complete investigations to determine shortcuts, like with Congruent Triangles on pp. 221-223 and 227-228). There are frequent opportunities for students to generalize a pattern to determine a rule. The whole structure of the text is for students to discover the geometric truths on their own through investigations where they are asked to then generalize and apply their findings.